Aviation Safety Information Analysis and Sharing (ASIAS)

ASIAS Overview

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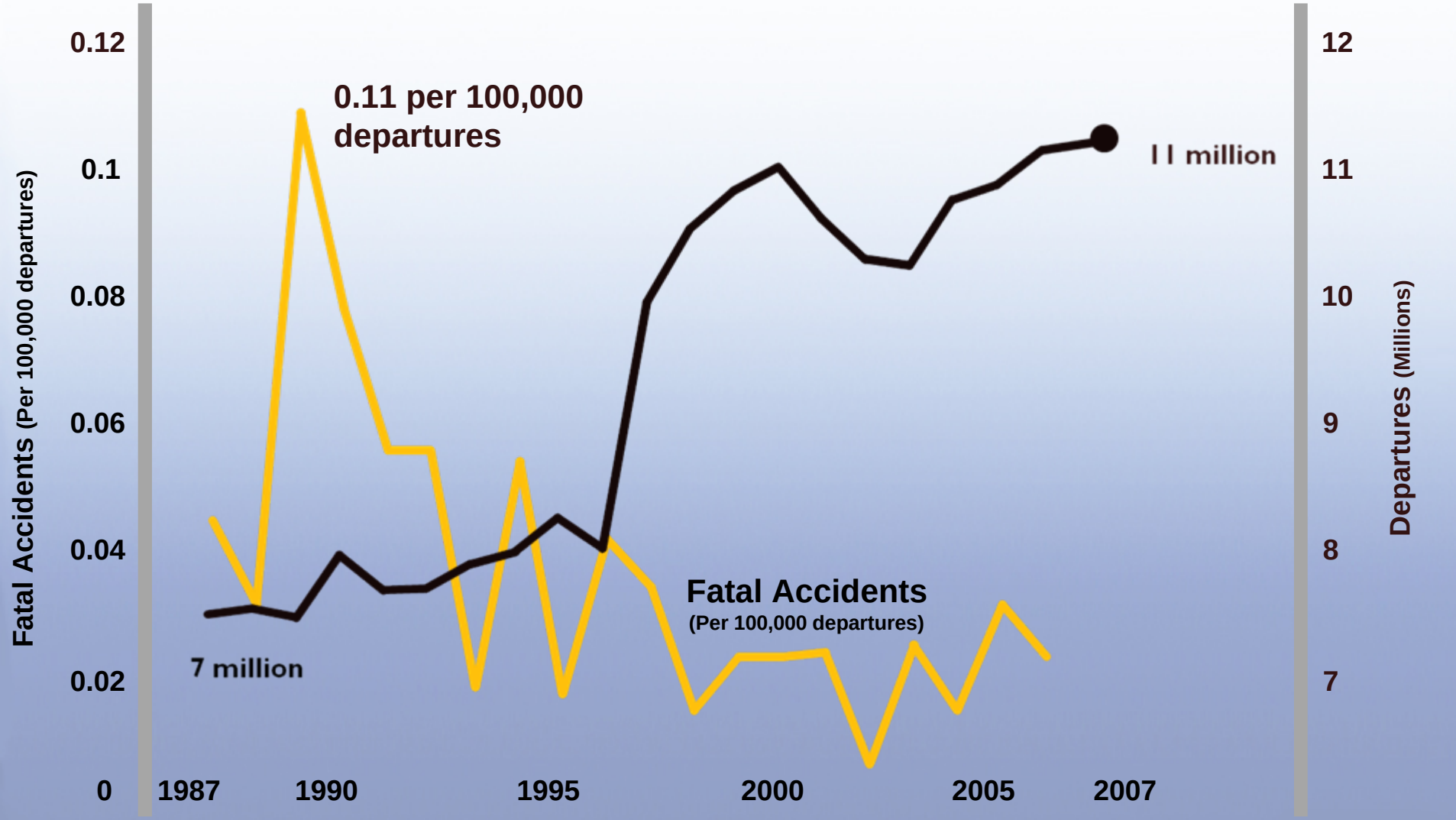
JPDO Safety WG

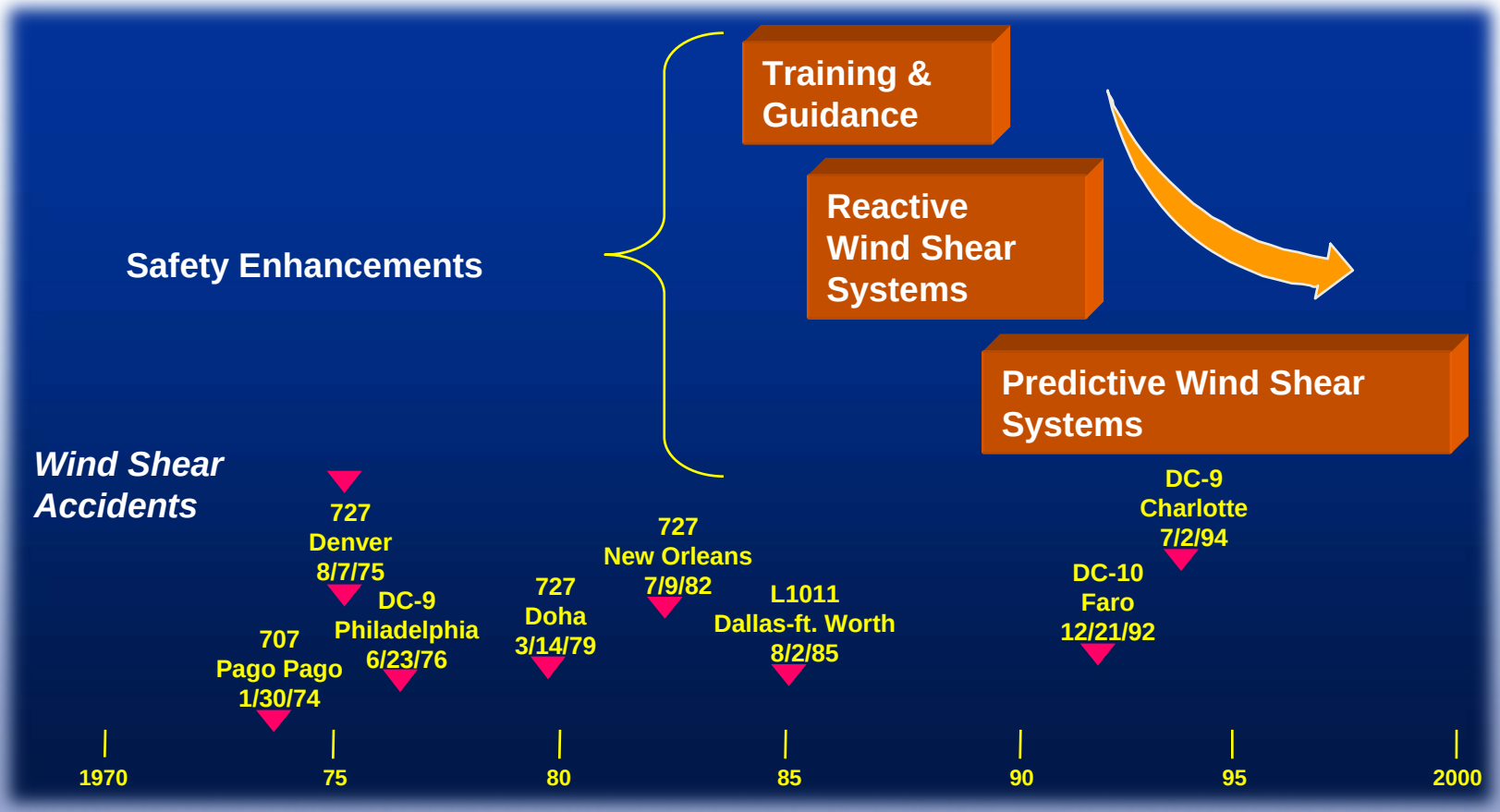
JPDO Environment Working Group
Operations Standing Committee
July 29, 2009

asias

We are Enjoying the Safest Period in Aviation History

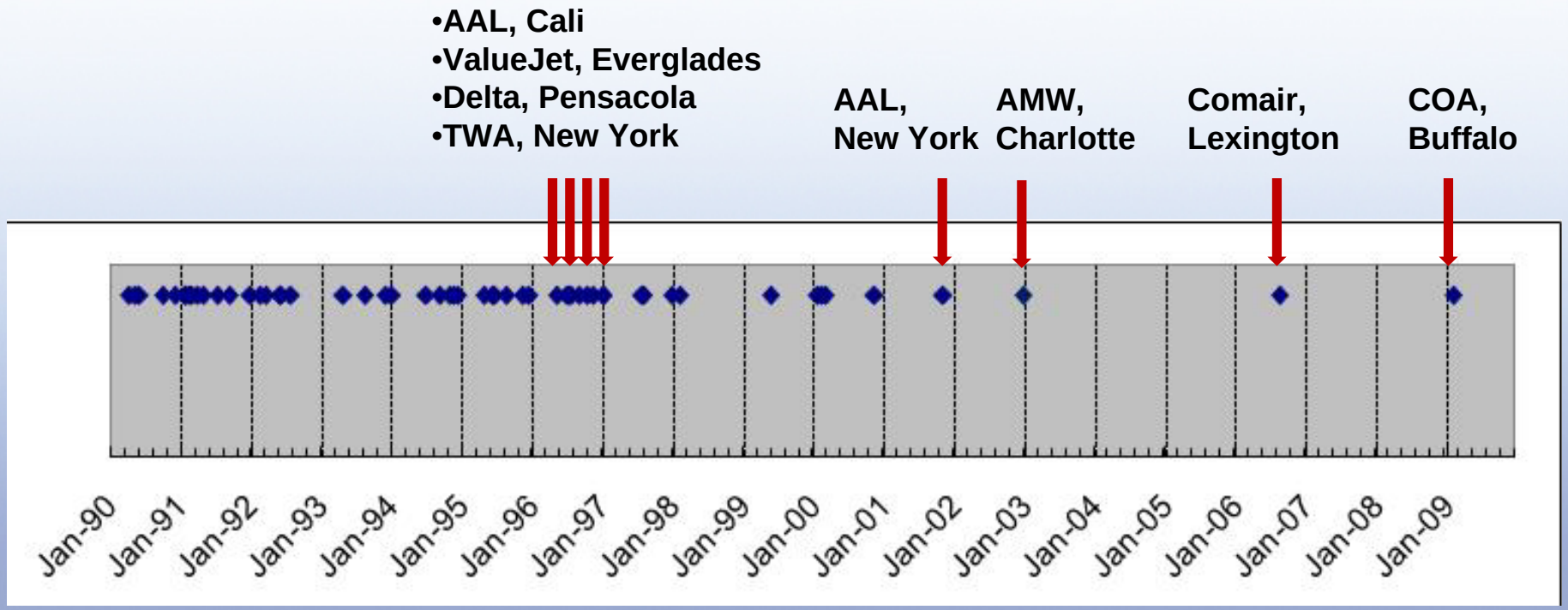


Forensic Analyses Have Resulted in Solutions



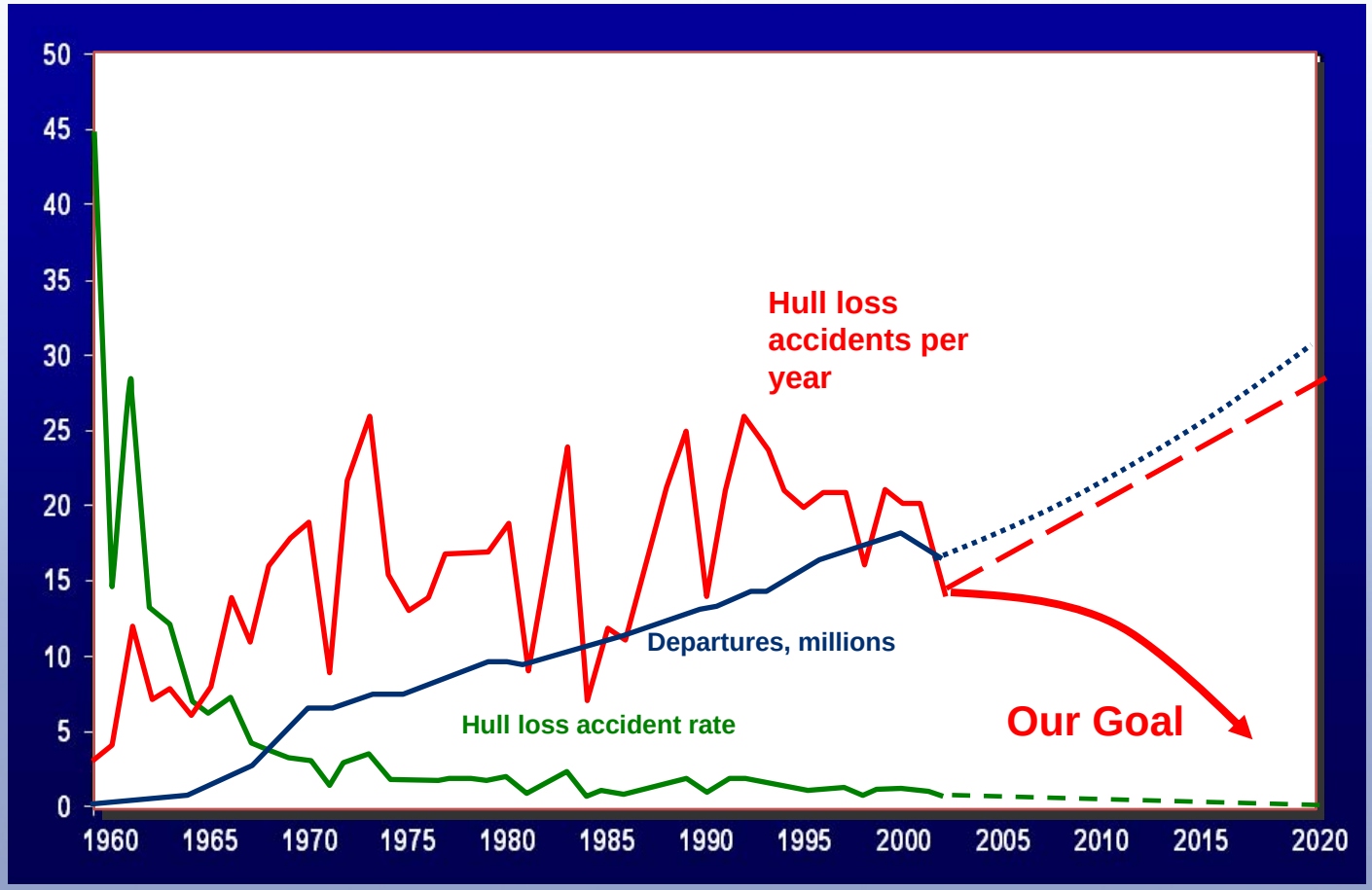
Example: Reduction in accidents due to wind shear

Accidents are Occurring Fewer and Farther in Between – a Good Thing!



But… We Need to do Better!

How Can We Improve Upon this Safety Record?



Source: Commercial Aviation Safety Team (CAST)

What is ASIAS....

A ***collaborative*** Government and Industry initiative on ***data sharing & analysis*** to proactively discover safety concerns ***before accidents*** or incidents occur, leading to ***timely mitigation*** and prevention.

ASIAS Data Management Objectives

- **Share aviation safety data with data providers**
- **Acquire and process data quickly**
- **Protect data**
- **Use data to identify systemic safety issues**
- **Support objectives of safety initiatives**
  - Commercial Aviation Safety Team (CAST)
  - International Helicopter Safety Team (IHST)
  - Others

Benefits of ASIAS

With ASIAS, the aviation community will be able to . . .

- **Identify Systemic Risks**
  - Establish safety baselines of current operations
  - Identify known and newly emerging system vulnerabilities
  - Monitor safety trends
- **Evaluate Identified Risks**
  - Estimate their probabilities
  - Assess their severities
  - Uncover event precursors
  - Diagnose event causation
- **Evaluate Interventions**
  - Assess the probable effects of safety enhancements through simulation studies
- **Monitor Intervention Effects**
  - Assess the effectiveness of safety enhancements (SEs) in accordance with metrics established by various safety initiatives

Types of Proactive Safety Analyses

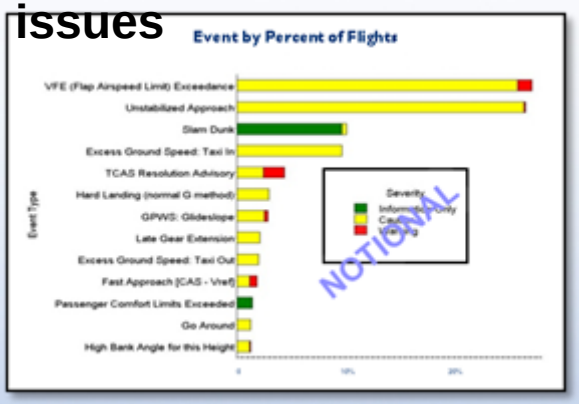
A Collaborative FAA-Industry ASIAS Executive Board (AEB) Provides Guidance and Oversight

Studies Completed or Underway

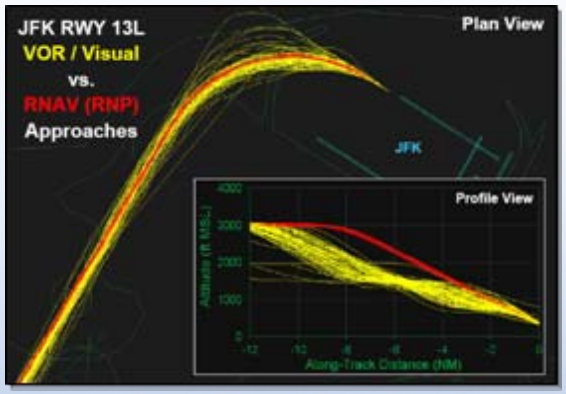
Directed Studies	Runway Safety
	Terrain Awareness Warning System Study
	TCAS Resolution Advisories
Current Safety Metrics Categories for CAST	Approach and Landing Risk Reduction
	Loss of Control
	Mid-Air Collision
	Controlled Flight Into Terrain
	Icing
	Cargo
	Maintenance
Initial Industry Benchmarks	Terrain Awareness Warning
	Airline Stability Metric
	TCAS Resolution Advisories

Aviation Safety Information Analysis and Sharing (ASIAS) Concept

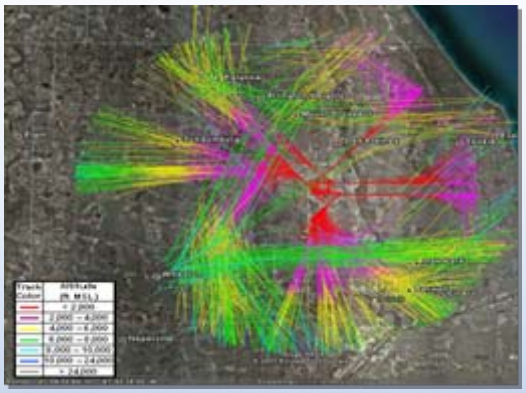
Combining isolated data sources enable new insights to potential safety issues



Derived Safety Metrics

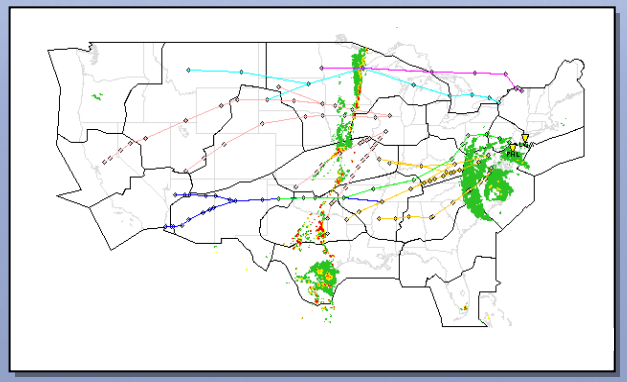


Simulated Procedures



Observed Aircraft Tracks

Airspace and Airport Designs



Archived Weather

Integrated Performance Reports

Data Sources Supporting the Studies

De-Identified FOQA Data

De-Identified ASAP Data

Safety Reports

- Aviation Safety Reporting System
- Runway Incursion
- Surface Incident
- Operational Error / Operational Deviation
- Pilot Deviation
- Vehicle or Pedestrian Deviation
- National Transportation Safety Board
- Accident/Incident Data System
- Service Difficulty Reports

ATC Information

- Traffic Management Reroutes and Delays
- Airport Configuration and Operations
- Sector and Route Structure
- Procedures
- Surveillance Data for En Route, Terminal and Airport

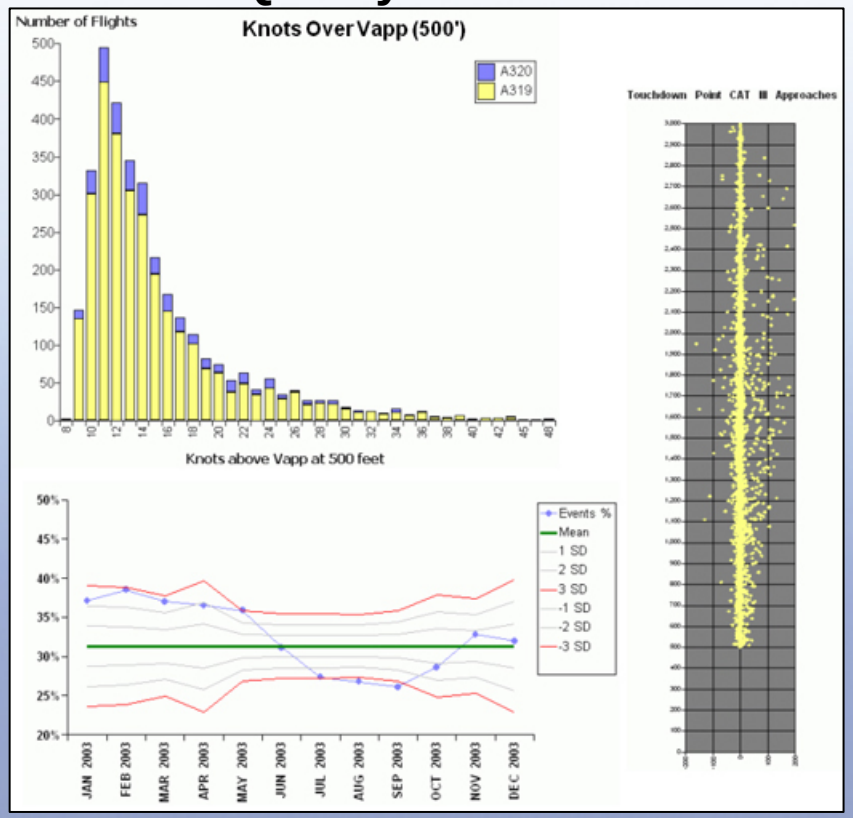
Other Information

- Bureau of Transportation Statistics
- Weather / Winds
- Manufacturer Data
- Avionics Data
- Worldwide Accident Data

ASIAS Aggregates Proprietary Airline Safety Data for Systemic Analysis

ASAP: Aviation Safety Action Program

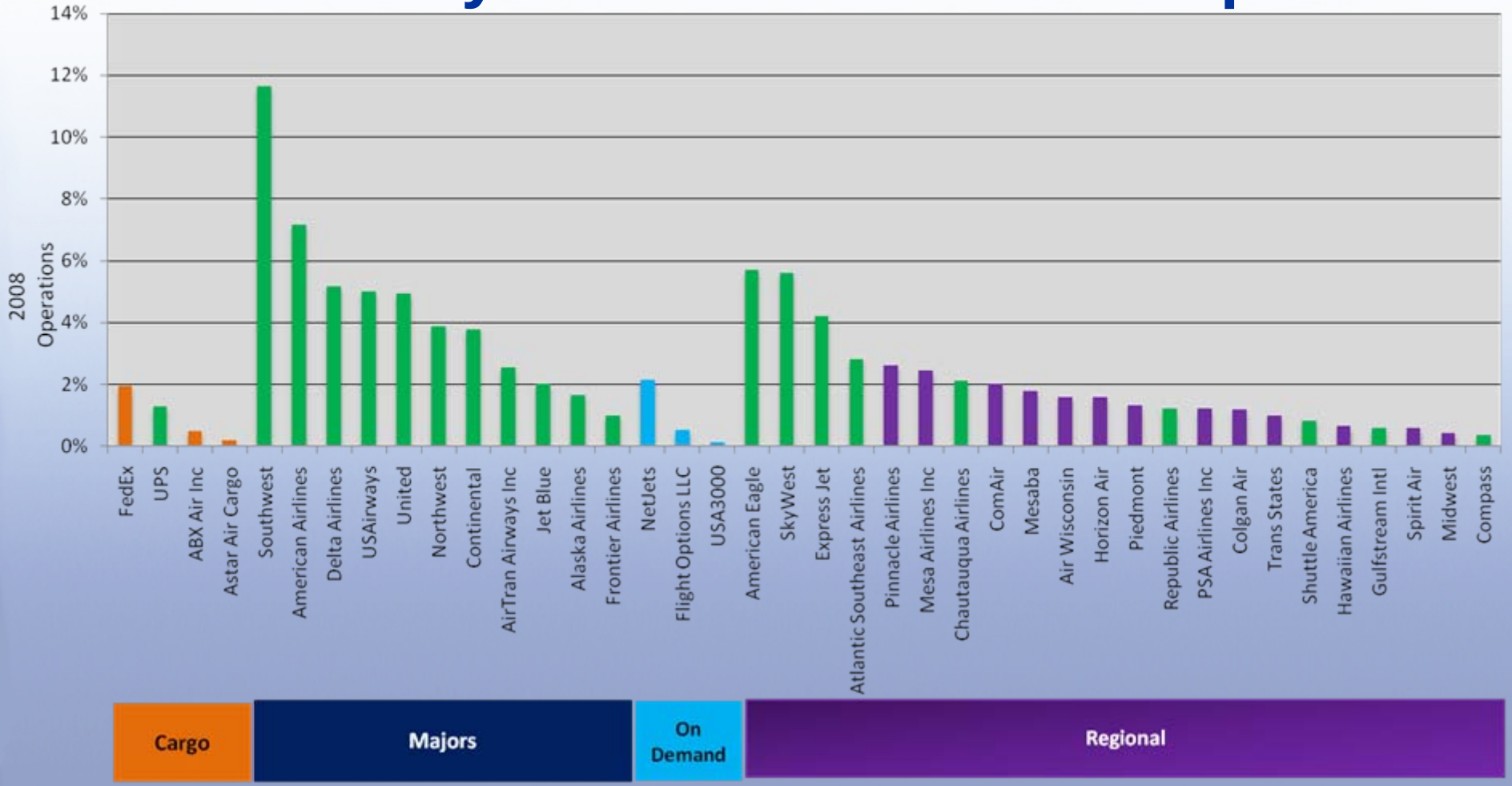
FOQA: Flight Operations Quality Assurance



Source: Sagem, Inc

Agreements are in Place Between MITRE and all Major Air Carriers

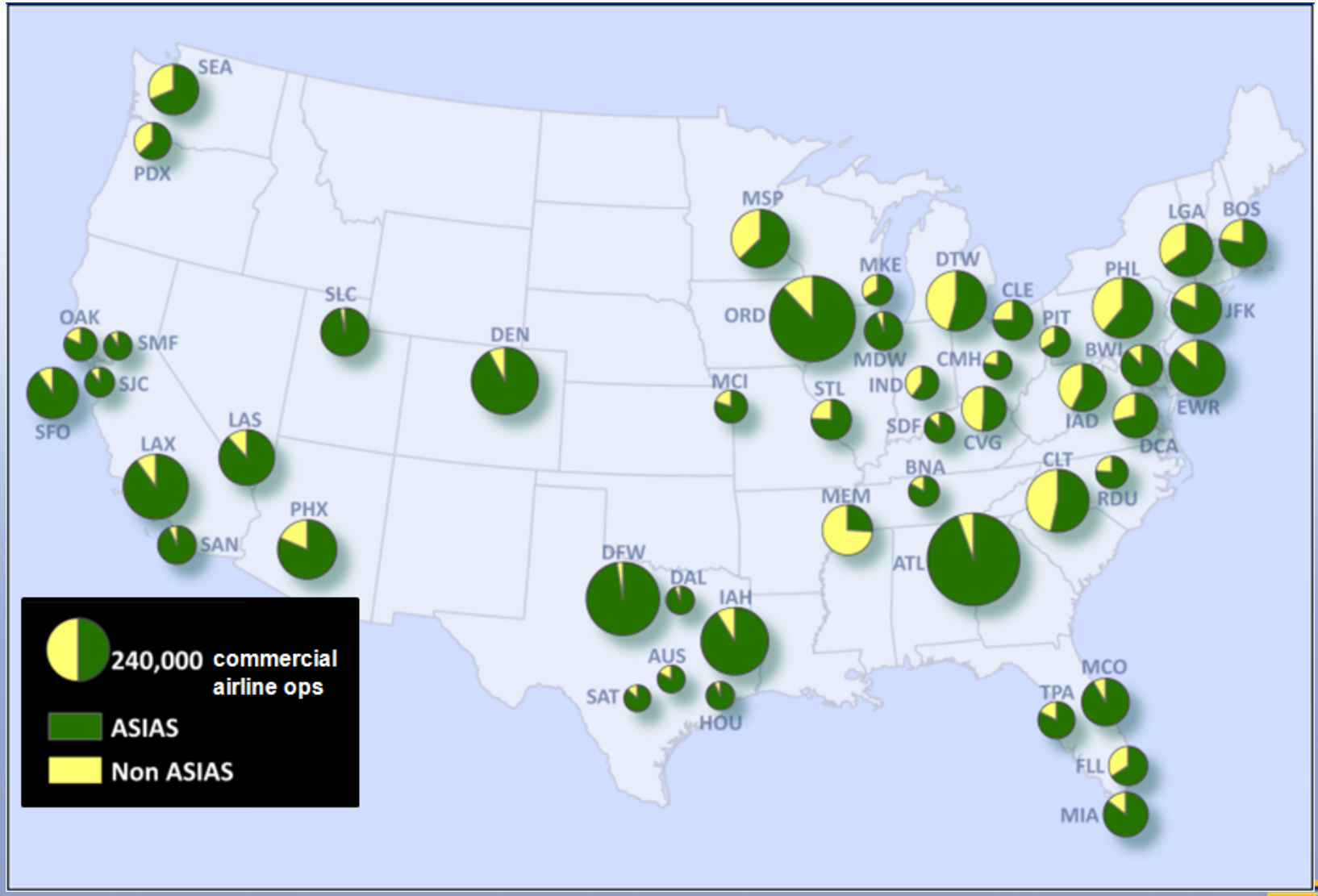
75% of 2008 NAS Operations are Covered by Current ASIAS Participants

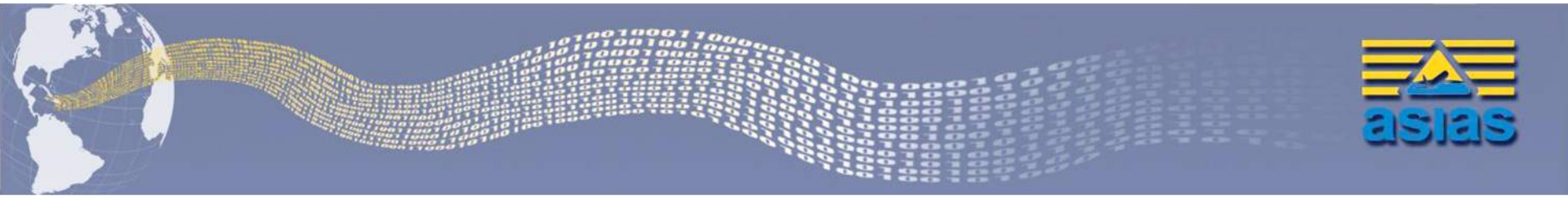


Indicates ASIAS Participant

21 ASIAS airlines with signed MOUs as of July 2008

ASIAS Participants at Major US Airports





Examples

ASAP Reports Provide Contributing Factors: Confusing Hold Short Lines With Multiple Runways

- **Example with 3 closely-spaced runway ends and numerous hold short lines (highlighted)**

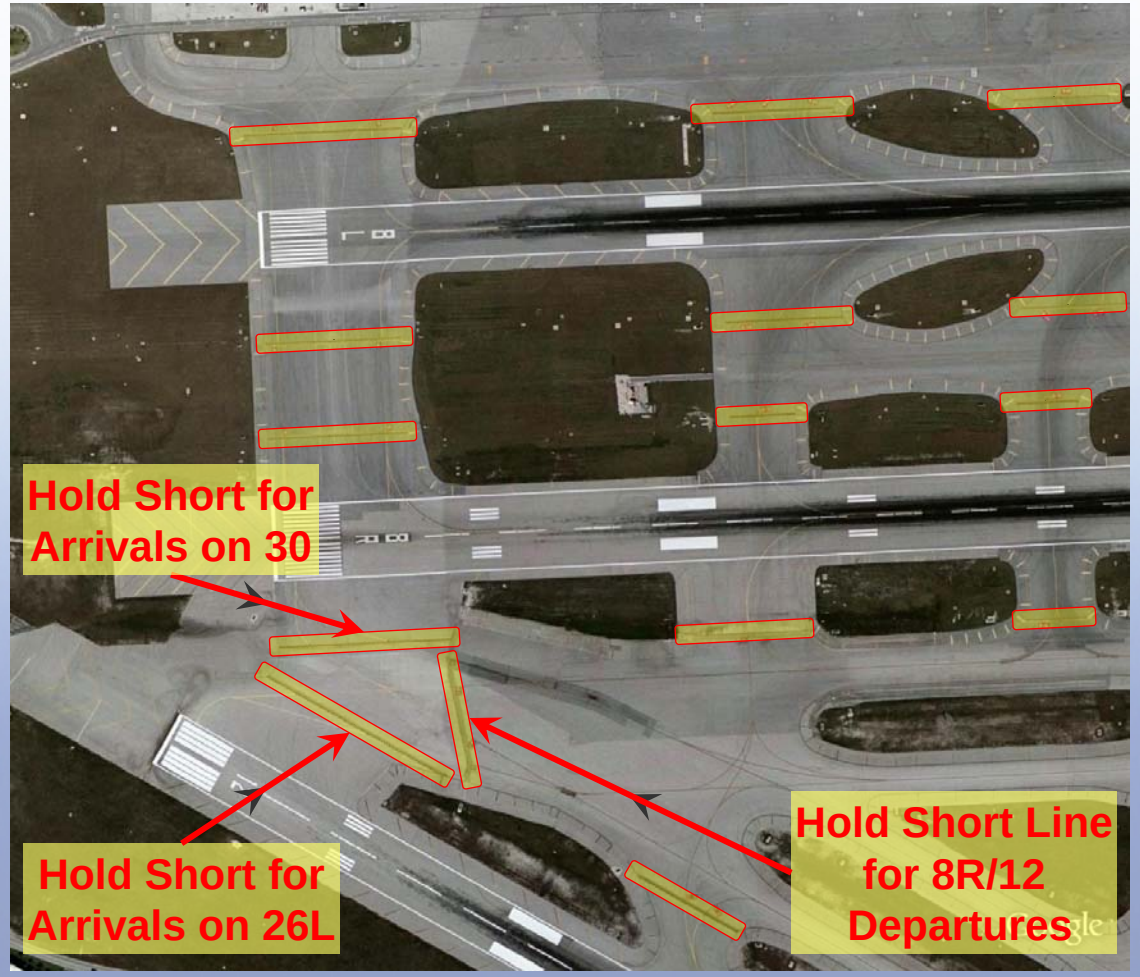
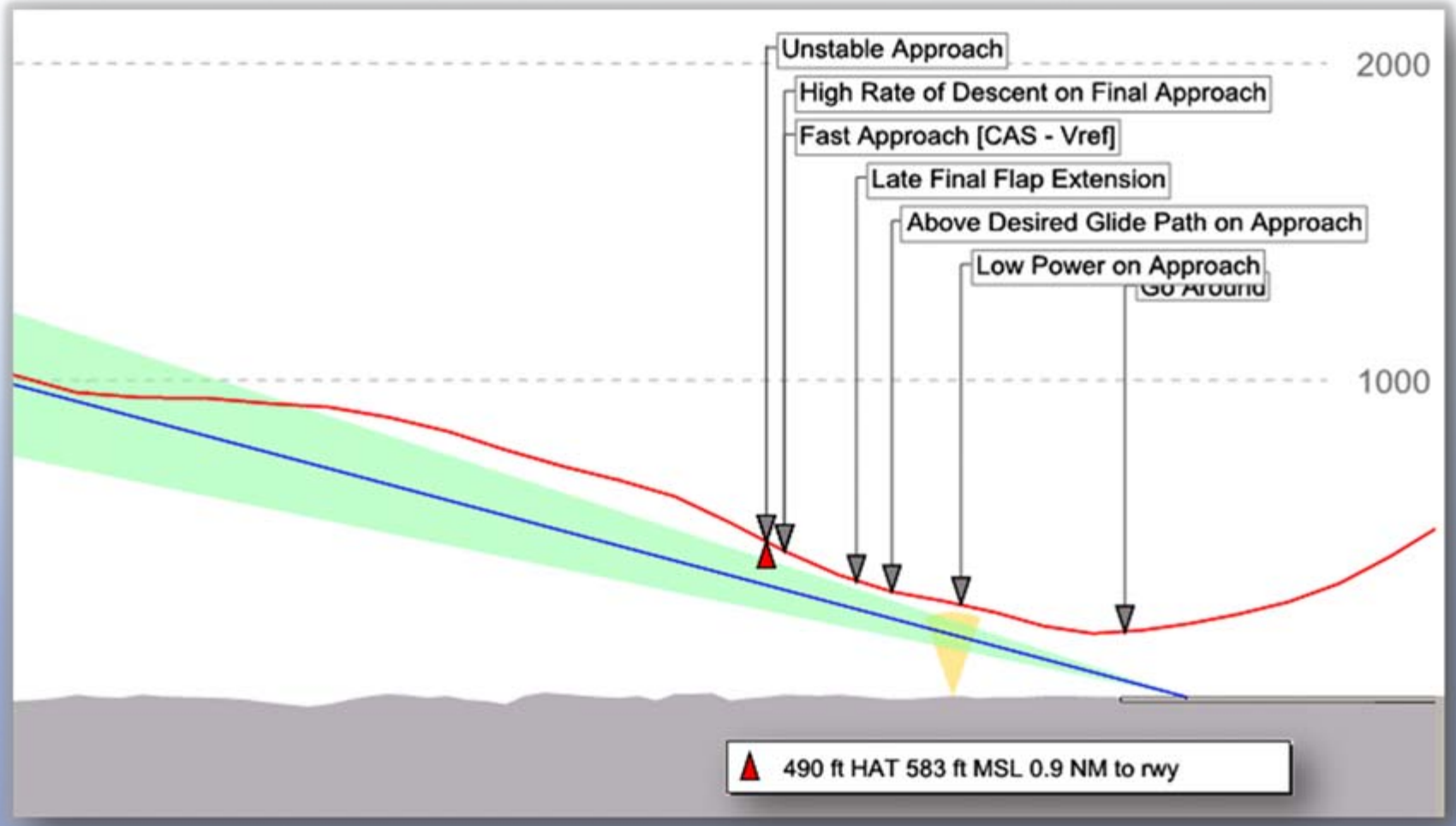
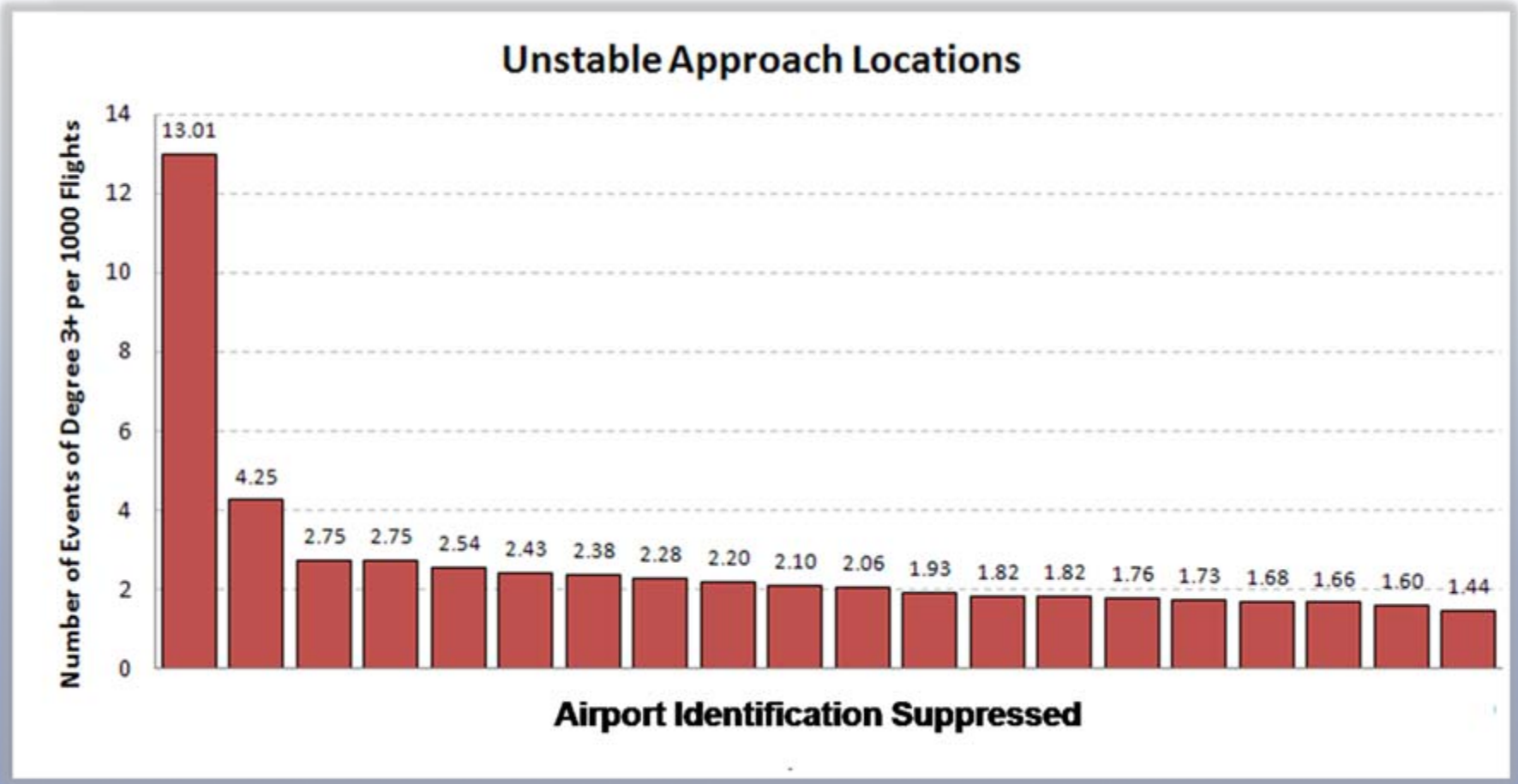


Image from Google Earth

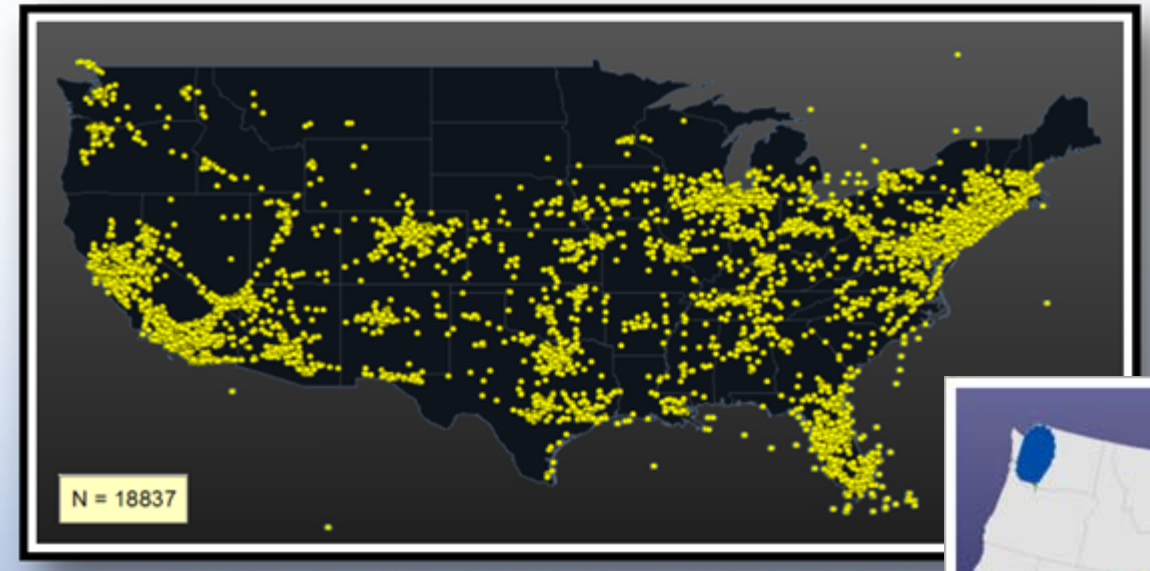
FOQA Data Provides Insight About Flights: Unstable Approaches

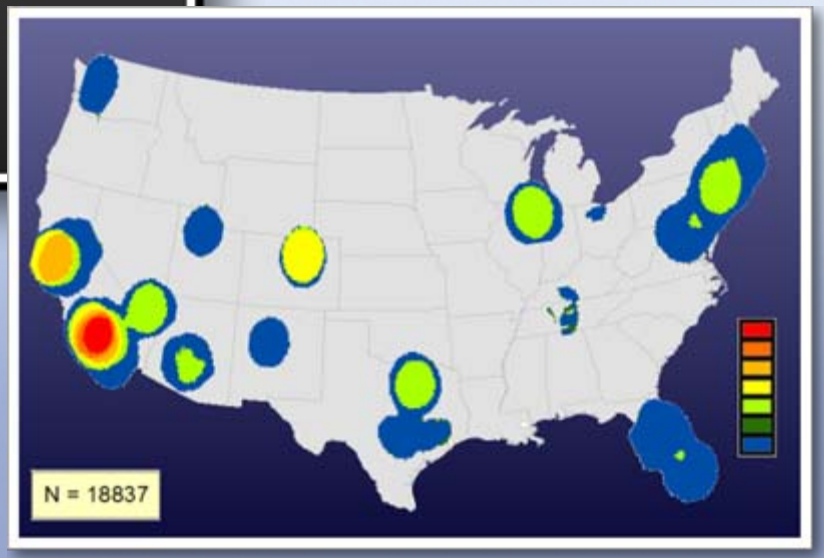


Aggregate Metrics Can Be Easily Generated and Analyzed



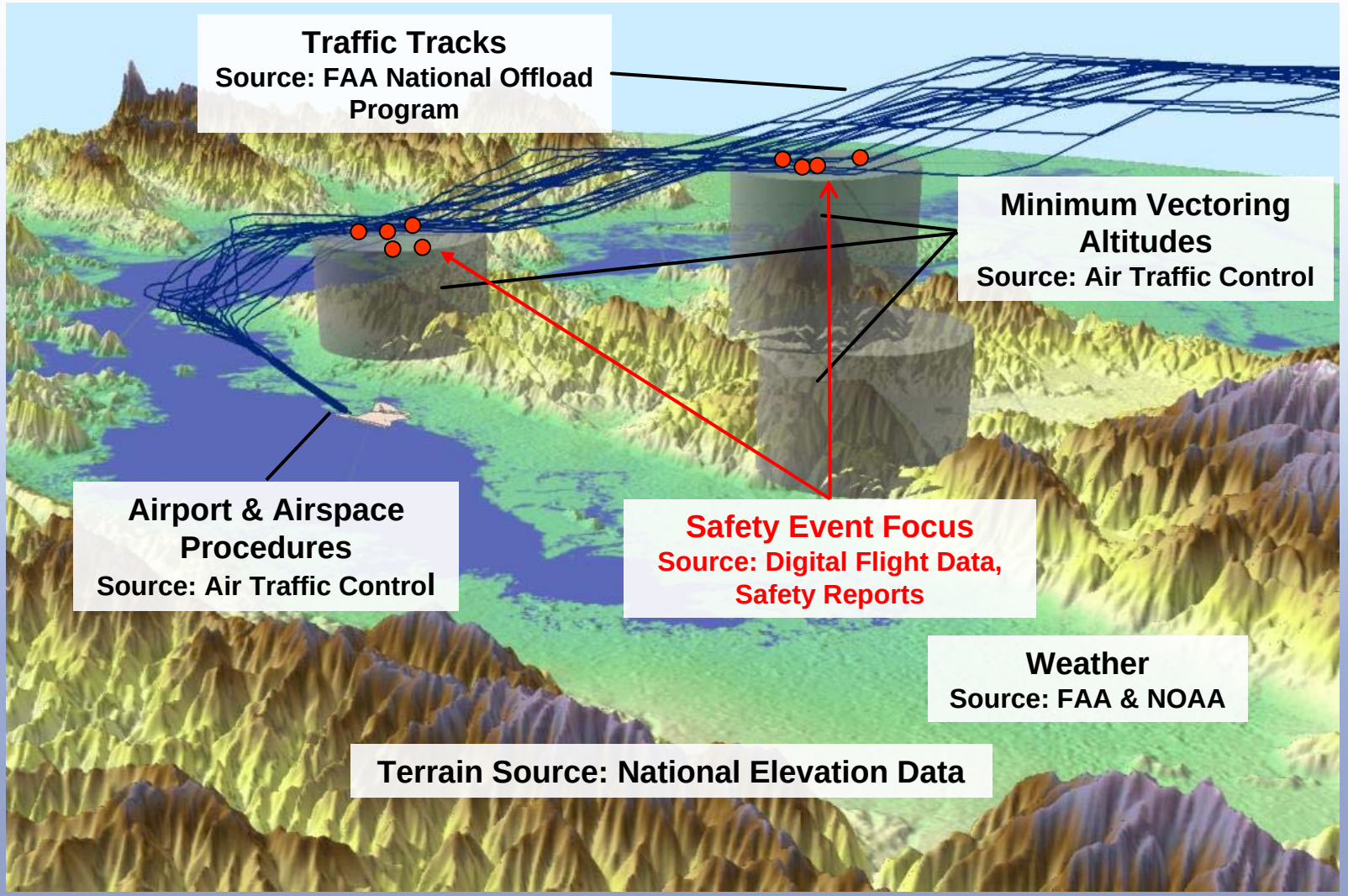
Integrated Data Enables a Shared Vision





- Traffic Alert and Collision Avoidance System (TCAS) Location and density maps
  - Reflects location at onset of TCAS Resolution Advisories (RAs)
  - Based on query of 2,261,922 FOQA flights

Data Fusion Provides Valuable Insights



ASIAS is Governed by Formal Principles

Data used solely for advancement of safety

Endorsement of voluntary submission of safety-sensitive data

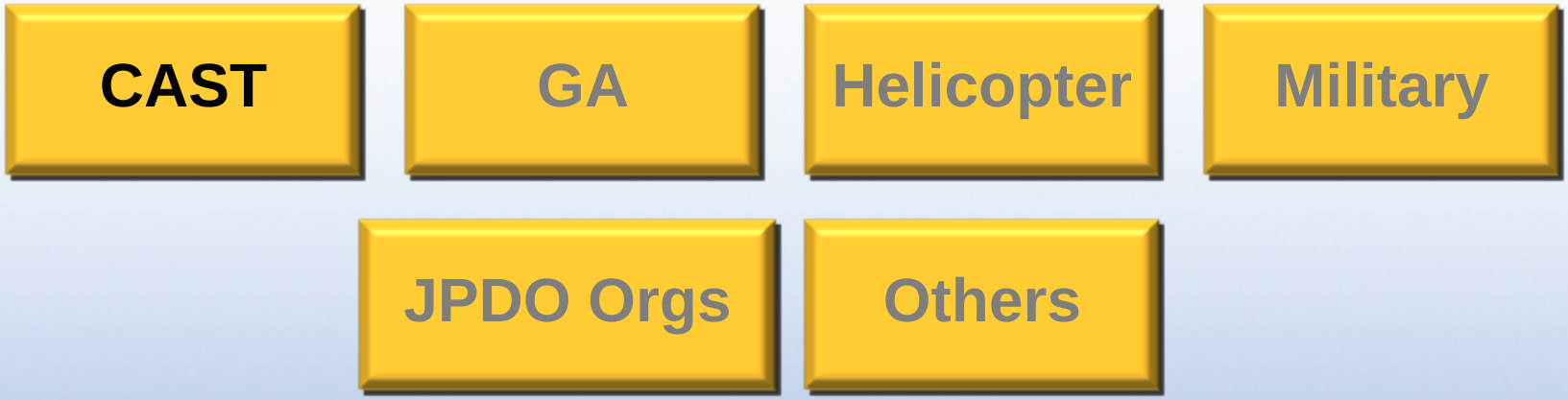
Carrier/OEM/MRO data are de-identified

Transparency – knowledge of how data are used

Procedures & policies established through collaborative governance

Analyses approved by an ASIAS Executive Board

ASIAS Information Sharing and Management Structure



ASIAS Executive Board (AEB)

- Consists of two Co-Chairs (AVS & Industry)
- Representative of key stakeholders
- Consensus-based decision making

AEB – Roles & Responsibilities

- **Guidance and Oversight of ASIAS program**
  - **Implementation of the working agreement for stakeholders**
  - **Provide strategic direction**
  - **Prioritization of ASIAS group activities**
  - **Focal point of product dissemination to appropriate stakeholders**
  - **Review and modify process as needed**
- **Primary interface between ASIAS analysts and stakeholders**
- **Coordinate analytical efforts among industry/government entities (e.g. EASA, CAA, etc)**
- **AEB to forward all analytical products to appropriate safety teams for in-depth analysis)**

ASIAS
Executive Board Membership

Don Gunther (Industry Co-Chair)

Peggy Gilligan (Government Co-Chair)

Jay Pardee/Paul Russell (JIMDAT Co-Chairs)

- **Government members:**
  - **John Allen, Director, Flight Standards Service, AFS-1**
  - **Dorenda Baker, Director, Aircraft Certification Service, AIR-1**
  - **Joseph Teixeira, Director, Safety Programs, Air Traffic Organization**
  - **Amy Pritchett, Director, NASA Aviation Safety Program**
- **Industry members:**
  - **Basil Barimo, Vice President, Operations, ATA**
  - **Rory Kay, Executive Air Safety Chairman, ALPA**
  - **Corky Townsend, Director Aviation Safety, Boeing Commercial Airplanes**
  - **Bob Young, Assistant Vice President of Civil Aviation, AIA**

Summary

- **We are in the midst of the *safest period* in aviation history**
- **Major causes of accidents have been addressed through forensic analysis – our task now is monitor hundreds of databases to assess aviation safety**
- **ASIAS provides for:**
  - **A *national aggregation* and analysis of individual airline safety data**
  - ***Integration* with other available data for improved contextual picture**
  - **Achieving a *predictive and prognostic ability* to identify risks and issues *before accidents and incidents occur***

Benefits all sectors of the aviation community

Additional Information

- **FAA ASIAS Points of Contact:**
  - Mike Basehore (FAA) - Mike.Basehore@faa.gov
  - Warren Randolph (FAA) – Warren.Randolph@faa.gov

- **FAA ASIAS Center:**
  - www.asias.faa.gov
  - asias@faa.gov